

WHAT IS CLAIMED IS:

1. A hologram erasing method comprising erasing a predetermined hologram by irradiating a recording region of the predetermined hologram recorded in an optical recording medium with a reference light beam and a signal light beam which holds random pattern data at the same time.
2. A hologram erasing method according to claim 1, wherein the signal light beam further holds data indicating that the recording region is a hologram erasing region.
3. A hologram erasing method according to claim 1, wherein the signal light beam further holds data indicating the number of times of hologram erasing at the recording region.
4. A hologram erasing method according to claim 1, further comprising applying exposure energy, which is no lower than the exposure energy during recording, to the recording region of the predetermined hologram by using the signal light beam and the reference light beam.
5. A hologram erasing method according to claim 1, further comprising causing an intensity distribution of the reference light beam on the optical recording medium to substantially

coincide with an intensity distribution of the signal light beam.

6. A hologram erasing method according to claim 1, further comprising irradiating the recording region of the predetermined hologram with the reference light beam having the same angle as a reference light beam used in recording the hologram, when the hologram is recorded by angle multiplex recording.

7. A hologram erasing method according to claim 1, further comprising irradiating the recording region of the predetermined hologram with the reference light beam having the same wavefront and position as a reference light beam used in recording the hologram, when the hologram is recorded by shift multiplex recording.

8. A hologram erasing method according to claim 5, further comprising generating the reference light beam, in which a phase is random and a shape and intensity are provided in accordance with a profile of the signal light beam.

9. A hologram erasing method according to claim 5, further comprising irradiating, with the reference light beam, only substantially the same region as the region which is irradiated

with the signal light beam or as a signal light beam defocused region.

10. A hologram erasing method comprising:

(a) separating a laser beam into a light beam for a reference light beam and a light beam for a signal light beam;

(b) intensity modulating the light beam for the signal light beam in accordance with a random pattern, to generate a signal light beam for erasing;

(c) generating the reference light beam, in which a phase is random and a shape and intensity are provided in accordance with a profile of the signal light beam for erasing, from the light beam for the reference light beam;

(d) irradiating a recording region of a predetermined hologram in an optical recording medium with the signal light beam for erasing;

(e) irradiating the region irradiated with the signal light beam for erasing with the reference light beam, at the same time as the region is irradiated with the signal light beam for erasing;

(f) destroying the predetermined hologram recorded in the recording region by an interference light beam caused by interference between the signal light beam and the reference light beam.

11. A hologram erasing method according to claim 10, wherein the signal light beam irradiating process (d) includes irradiating the recording region with the signal light beam for erasing after the signal light beam for erasing is Fourier-transformed.

12. A hologram erasing method according to claim 10, wherein the reference light beam irradiating process (e) includes irradiating, with the reference light beam, only substantially the same region as the region which is irradiated with the signal light beam or as a signal light beam defocused region.

13. A hologram erasing method according to claim 10, wherein the signal light beam holds data indicating that the recording region is a hologram erasing region.

14. A hologram erasing method according to claim 10, wherein the signal light beam holds data indicating the number of times of hologram erasing at the recording region.

15. A hologram erasing method according to claim 10, wherein the hologram destroying process (f) includes applying exposure energy, which is no lower than the exposure energy during recording, to the recording region of the predetermined hologram by the interference light beam.

16. A hologram erasing method according to claim 10, further comprising irradiating the recording region of the predetermined hologram with the reference light beam having the same angle as a reference light beam used in recording the hologram, when the hologram is recorded by angle multiplex recording.

17. A hologram erasing method according to claim 10, further comprising irradiating the recording region of the predetermined hologram with the reference light beam having the same wavefront and position as a reference light beam used in recording the hologram, when the hologram is recorded by shift multiplex recording.

18. A hologram erasing apparatus which is configured so as to perform a hologram erasing method according to claim 1.

19. A hologram erasing apparatus comprising:

- a light source for outputting a coherent light beam;
- a beamsplitter for separating the coherent light beam into a light beam for a reference light beam and a light beam for a signal light beam;
- a spatial modulator for intensity modulating the light beam for the signal light beam in accordance with a random

pattern, to generate a signal light beam for erasing; and a holographic optical element for generating the reference light beam, in which a phase is random and a shape and intensity are provided in accordance with a profile of the signal light beam for erasing, from the the light beam for the reference light beam,

wherein a predetermined hologram is erased by irradiating a recording region of the predetermined hologram in an optical recording medium with the signal light beam and the reference light beam.

20. A hologram erasing apparatus according to claim 19, wherein the hologram erasing apparatus is configured to irradiate, with the reference light beam, only substantially the same region as the region which is irradiated with the signal light beam or as a signal light beam defocused region with.